

Air Quality in South Central Kansas

The view from Wichita



Wichita Department of Environmental Services



Air Quality

Animal Control

Child Care Licensure

Food Protection

Environmental Assessment & Remediation

Water Quality

Air Quality-HazMat Program



Protecting People...

Your day-to-day activities expose you to pollutants or other environmental health risks.

We work to ensure the health and safety of the Community.

Our job is to identify, assess, and reduce or eliminate health risks.

Air Quality-HazMat Program



Protecting the environment...

Monitoring

Education

Code enforcement

To protect and improve the Community's
environmental quality.

Air Quality-HazMat Program

- Operate the local air monitoring network for National Ambient Air Quality Standards (6 criteria air pollutants)
- Inspection of air emission sources
- Investigate all air quality complaints in Wichita & Sedgwick County
- Perform asbestos inspections at demolition sites

Air Quality-HazMat Program

(Continued)

- Conduct indoor air quality investigations
- Respond to hazardous material incidents
- Provide education to citizens on air quality topics



Monitor 001.jpg

Air Monitoring Network



Major Source Inspections



Inspect large industries for compliance with Federal, State & local air quality regulations

Area Source Inspections

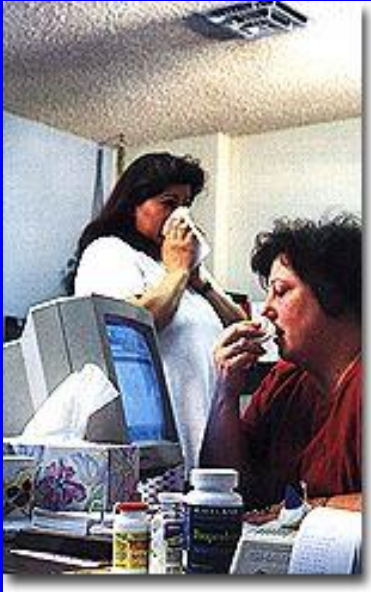


Area Sources are those that do not have the potential to emit at major source limits, yet still are regulated by Federal, State or Local air quality regulations.

Incinerators, dry cleaners and smaller print shops are examples of Area Sources.

Area Sources are important because there are so many of them.

Indoor Environmental Quality



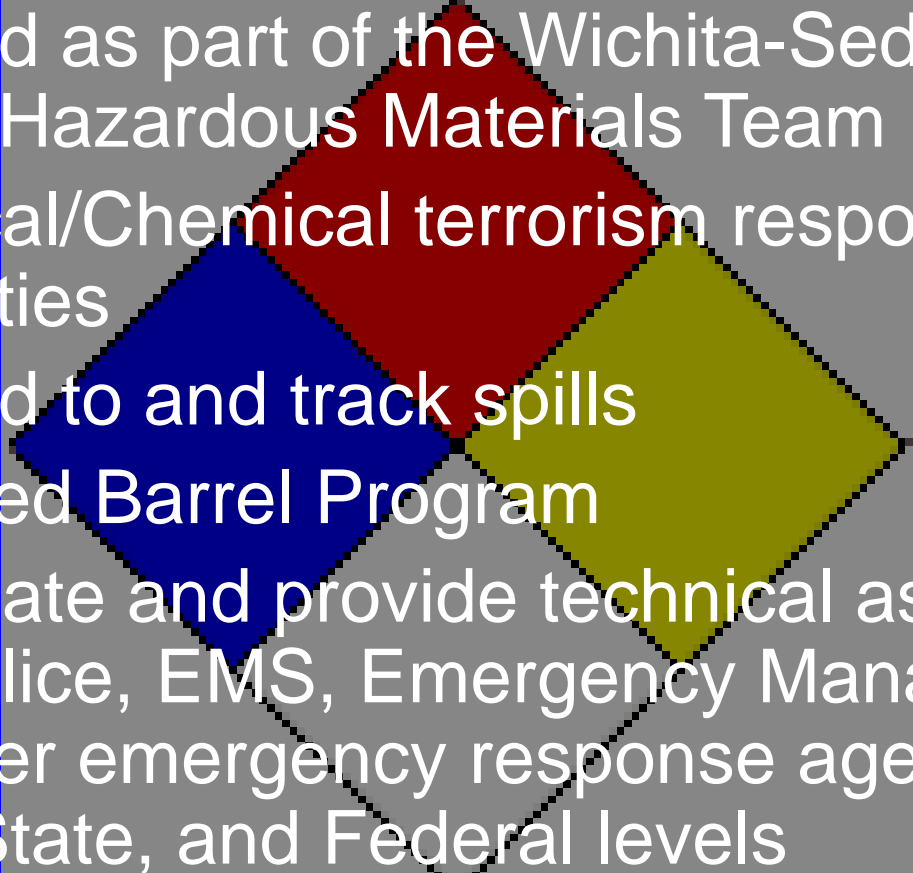
Investigate indoor environments for conditions which could adversely affect occupant health. The assessment process includes potential risk and recommended solutions.

Asbestos Demolition Inspection



Buildings to be demolished are inspected throughout the process to verify compliance with Federal & State asbestos regulations

Environmental Hazardous Materials Response Unit

- 
- Respond as part of the Wichita-Sedgwick County Hazardous Materials Team
 - Biological/Chemical terrorism response capabilities
 - Respond to and track spills
 - Orphaned Barrel Program
 - Coordinate and provide technical assistance to Fire, Police, EMS, Emergency Management, and other emergency response agencies at Local, State, and Federal levels





Complaint Response



Air Quality responds to a variety of ambient air complaints-

- Open burning
- Blowing dust/dirt
- Odors
- Smoke.

Complaint Response



Complaint Response



Public Education

- We provide presentations for
 - Educational groups (K-12, university, etc)
 - Civic groups
 - Local government
 - Other stakeholder groups



Local Health Implications of Air Pollution*

In Sedgwick County-

- Approximately 36,000 (8% of the population) have asthma
- Over 13,000 people have chronic bronchitis
- Nearly 5,000 cases of emphysema
- Over 100,000 citizens have cardiovascular disease

- *American Lung Association report

AIR QUALITY is An Immediate Issue

You wouldn't drink polluted water,
so why would you breathe polluted air?

(How long can you hold your breath?)

National Ambient Air Quality - Six Criteria Pollutants -

- Ozone
- Particulate Matter (PM 2.5 & PM 10)
- Carbon Monoxide (CO)
- Nitrogen oxides (NO_x)
- Sulfur oxides (SO_x)
- Lead (Pb)

Air Pollutants of Local Concern

Ground Level Ozone (O_3)

Particulate Matter

- PM 2.5
- PM 10

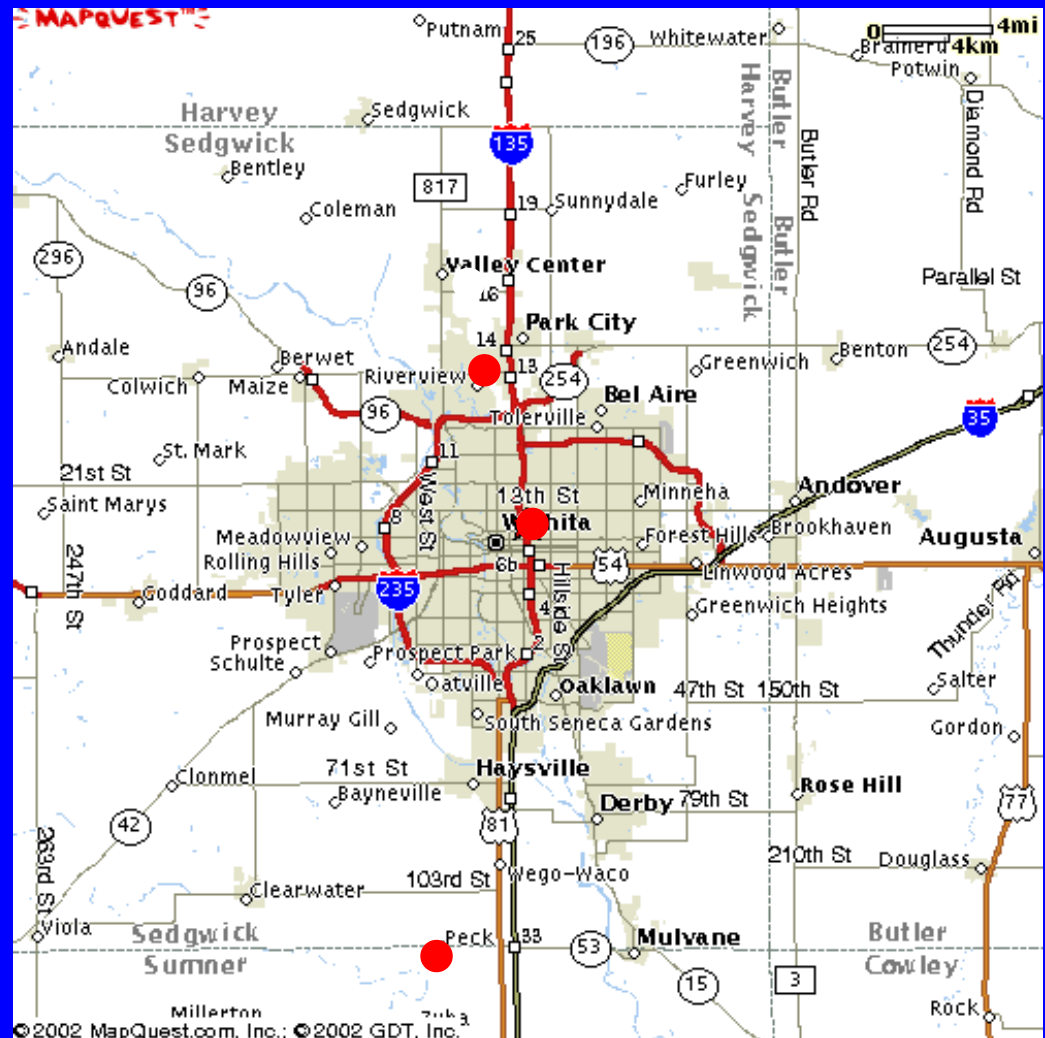
Air Toxics

CAA Attainment Status (Ozone)

- Despite the stricter new federal ozone standard (March 2008), the Wichita urban area is currently in compliance with the Clean Air Act for all monitored pollutants.
- Ozone continues to be the criteria air pollutant of greatest concern for the urban area.

Location of Ozone Monitors in South Central Kansas

- Ozone Monitor sites



What Makes a Bad Air Day (Ozone) in South Central Kansas?

Hot temperatures...

+

Sunny skies...

=

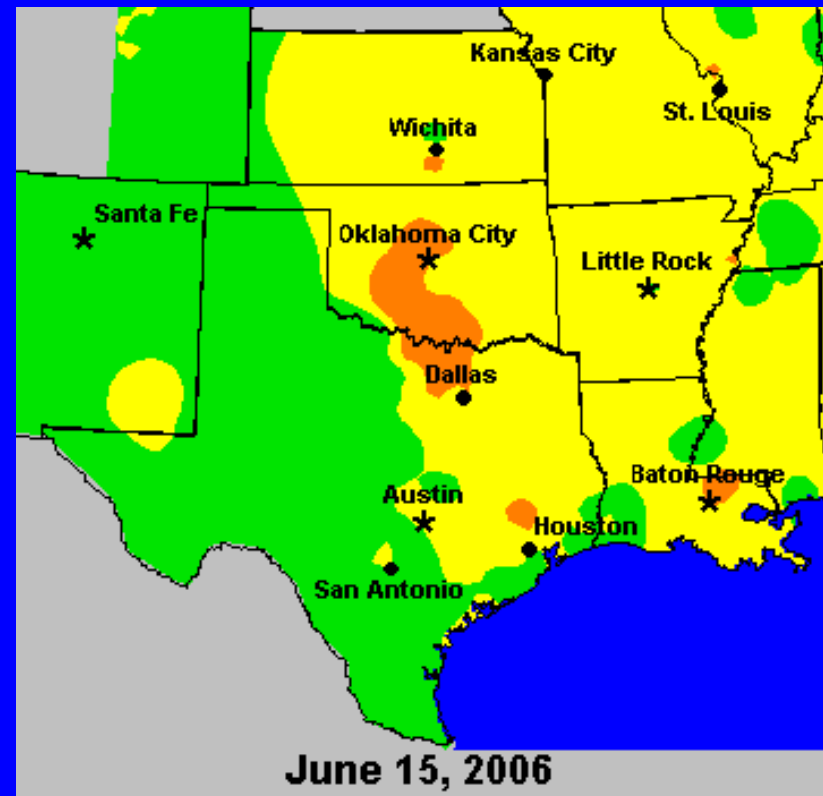
unhealthy ozone levels

+

South winds???

Wichita Dept of Environmental Health and KDHE are working together to determine:

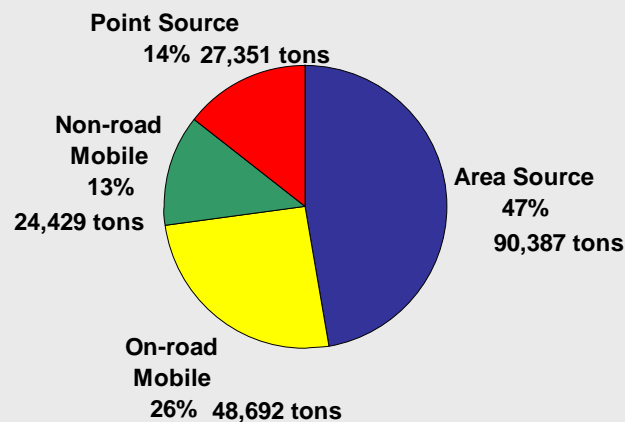
- What local sources are significant contributors
- The impact of weather and transport from other upwind urban/industrial areas



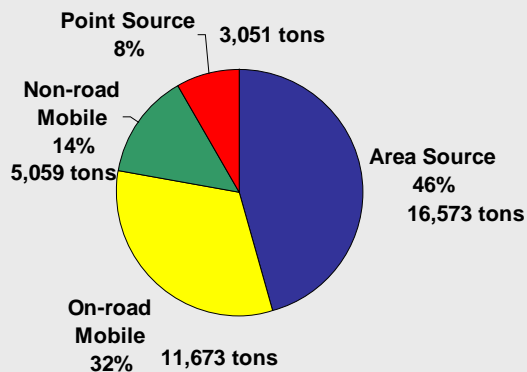
Local Sources

2002 Kansas VOC Emissions by Source Type

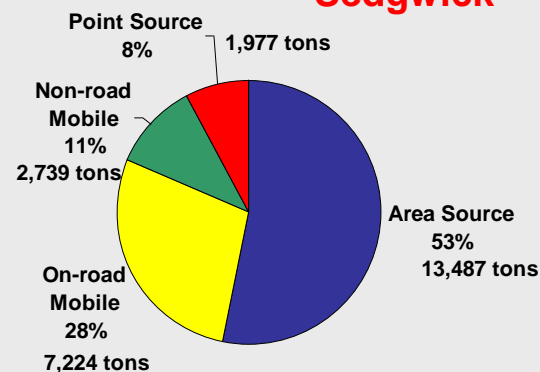
State-wide



Johnson & Wyandotte

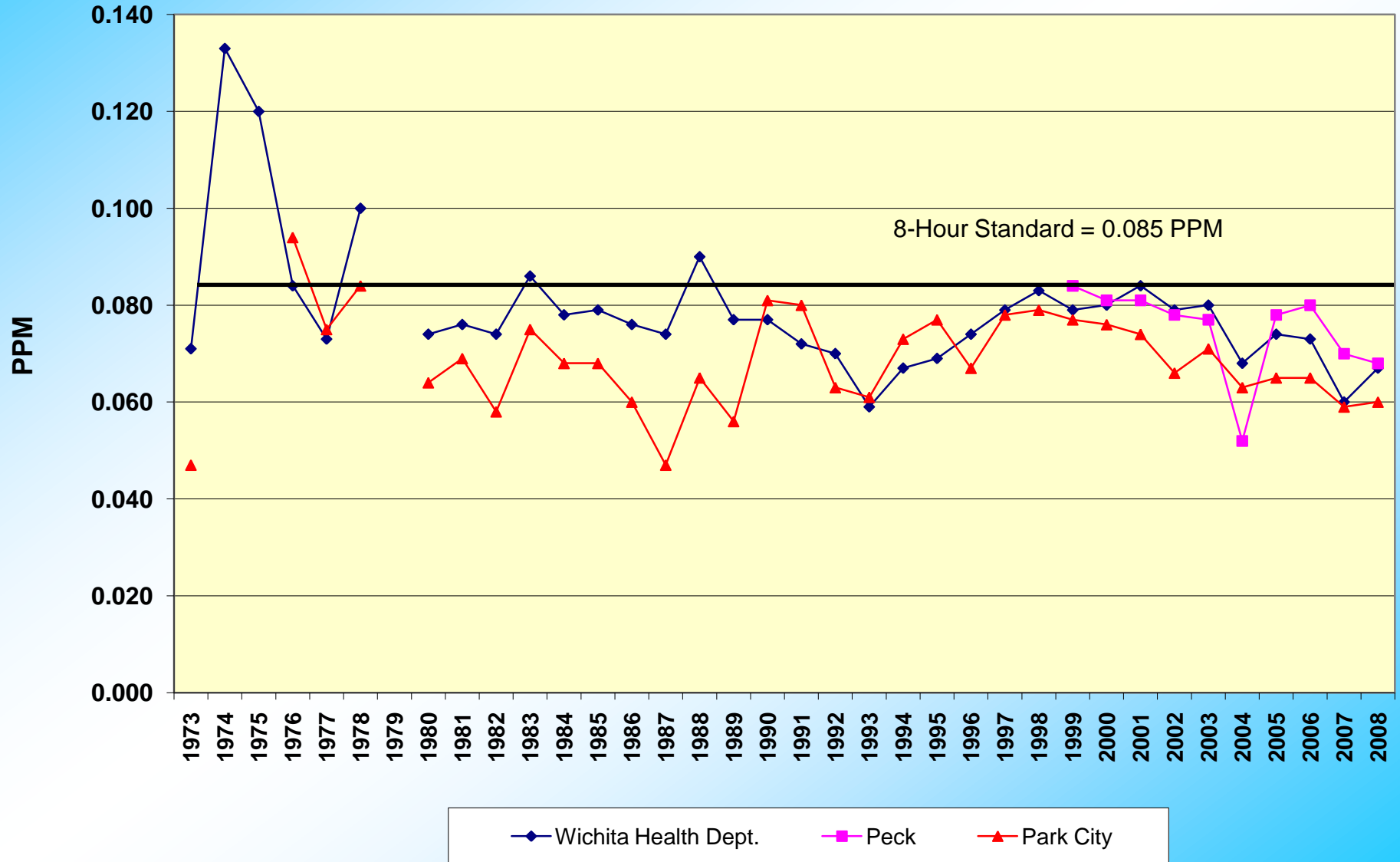


Sedgwick



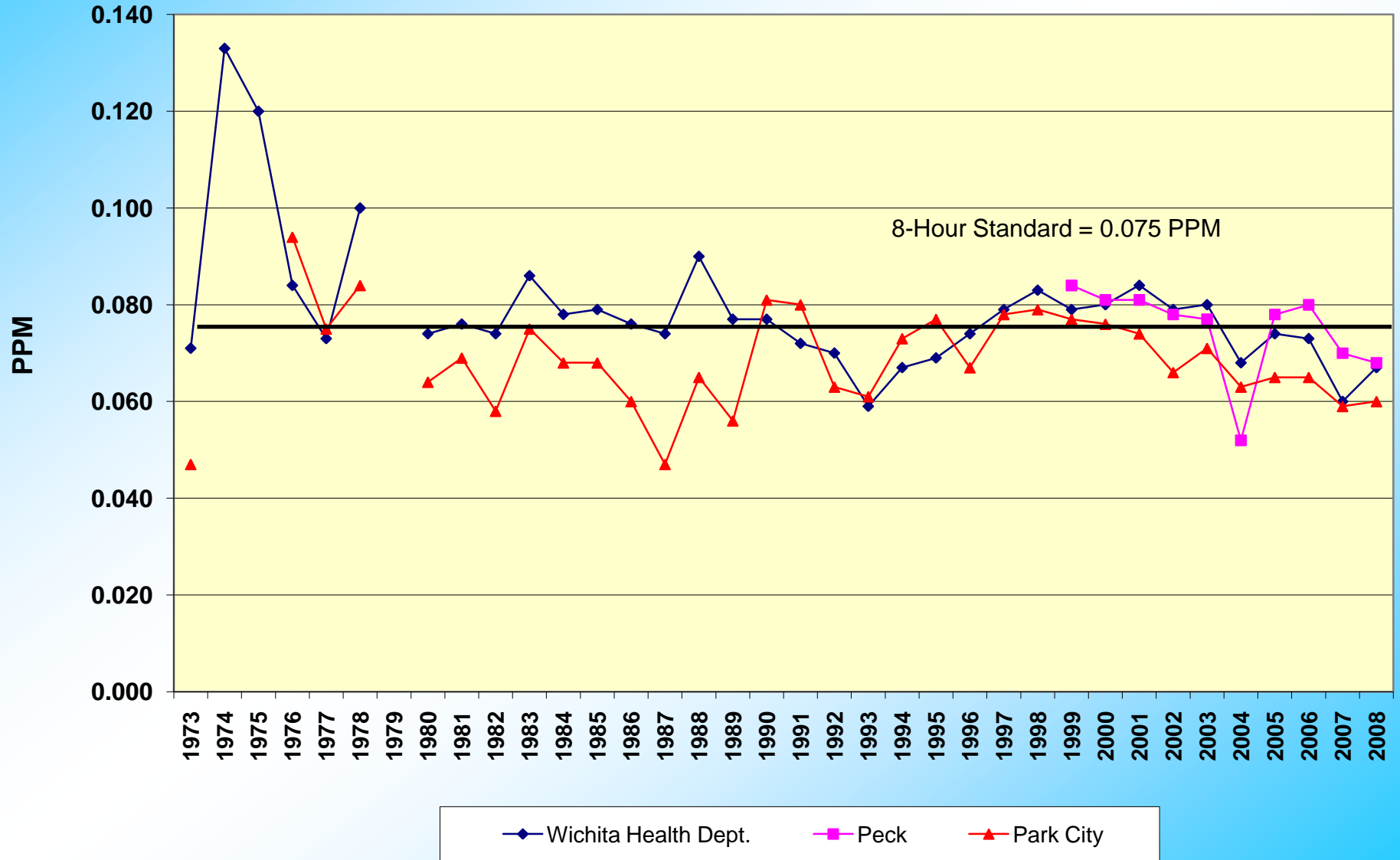
Wichita Ozone Trend

1997 Standard (.084 ppm)



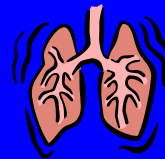
Wichita Ozone Trend

2008 EPA Standard (.075 ppm)



Health Effects of Exposure to Ozone

- Coughing
- Nose and throat irritation
- Chest pain
- Reduced lung function
- Increased susceptibility to respiratory illnesses
- Aggravation of asthma
- Children and people with chronic lung diseases are particularly at risk



More Health Impacts



- Every day, the average adult breathes over 3,000 gallons of air - children breathe even more air per pound of body weight (higher metabolism rates).
- Ozone can damage lung tissue and reduce lung function.
- Ozone is a known asthma trigger; it can also create sensitivity to other allergens.
- Eight percent of all kids in the U.S. have asthma and Asthma is the fastest growing childhood disease in the U.S.



Economic Effects of Ozone – NonAttainment (Private Sector)

- Increased costs to industry/commerce for air pollution controls.
- Limits on existing business expansion plans
- New businesses have to show they don't contribute to increased air pollution.
- Ozone is responsible for billions of dollars in agricultural crop losses each year in the United States.
- Overall drag on economic development

Economic Effects of Ozone - NonAttainment

(State & Local government)

- Possible annual Motor Vehicle Inspection & Maintenance (I & M) Programs.
- More extensive Administrative and Planning requirements for transportation and other services.
- Less local control of funding and priorities.
- Non-attainment would place sanctions on the entire MSA (Sedgwick, Sumner, Harvey and Butler Counties).

Economic Effects of Ozone – Non-Attainment (Overall)

- Our analysis showed that the annual economic impact of Wichita becoming an ozone non-attainment area would be about \$10,000,000 annually for at least ten years.*
- This analysis was conducted at the request of the Wichita Air Quality Improvement Task Force.
- The nonattainment area would include Sedgwick, Harvey, Butler, and Sumner counties.
- *Based on a population-to-cost-basis comparison ratio of five U.S. cities

Actions Taken to Date

- City Manager's Air Quality Improvement Task Force formed and holding regular meetings (since 2001)
- “Real Time” Air Quality Data on the Web from local air monitoring sites (2002) www.wichita.gov/aq
- Report to City Management and Council with list of strategies to reduce urban ozone levels (2004 & 2007)
- Emission Inventory of air pollution sources and activities in Sedgwick County (2004)
- Voluntary Vehicle Emissions Testing (2004 - 2008)



Wichita

Air Quality Improvement Task Force

Community Representatives:

- **Chamber of Commerce**
- **Major Local Industries**
- **Wichita State University**
- **Kansas State University (SBEAP)**
- **USD259**
- **Sierra Club**
- **Interested Citizens**

Government Representatives:

- **City of Wichita**
- **Sedgwick County**
- **Kansas Dept of Health & Environment**
- **Kansas Dept of Transportation**
- **US EPA, Region VII**
- **US Dept of Transportation**

Task Force Recommendations

- City and County consider purchase of cleaner fuels and more efficient vehicles.
- Consider funding of gas cap replacement project.
- Continue voluntary vehicle emission testing program
- Install Stage 1 emission controls on City fuel storage tanks.

Task Force Recommendations

- Continued public awareness and education efforts
- Continue to work with local industry to encourage voluntary emissions reductions
- Seek KDHE and EPA assistance for further identifying emissions sources and voluntary emission control strategies.

Challenges/Frustrations in Air Quality

- All the magic bullets that are available are expensive, require mandatory actions and are primarily available to ozone nonattainment areas.

The Good News

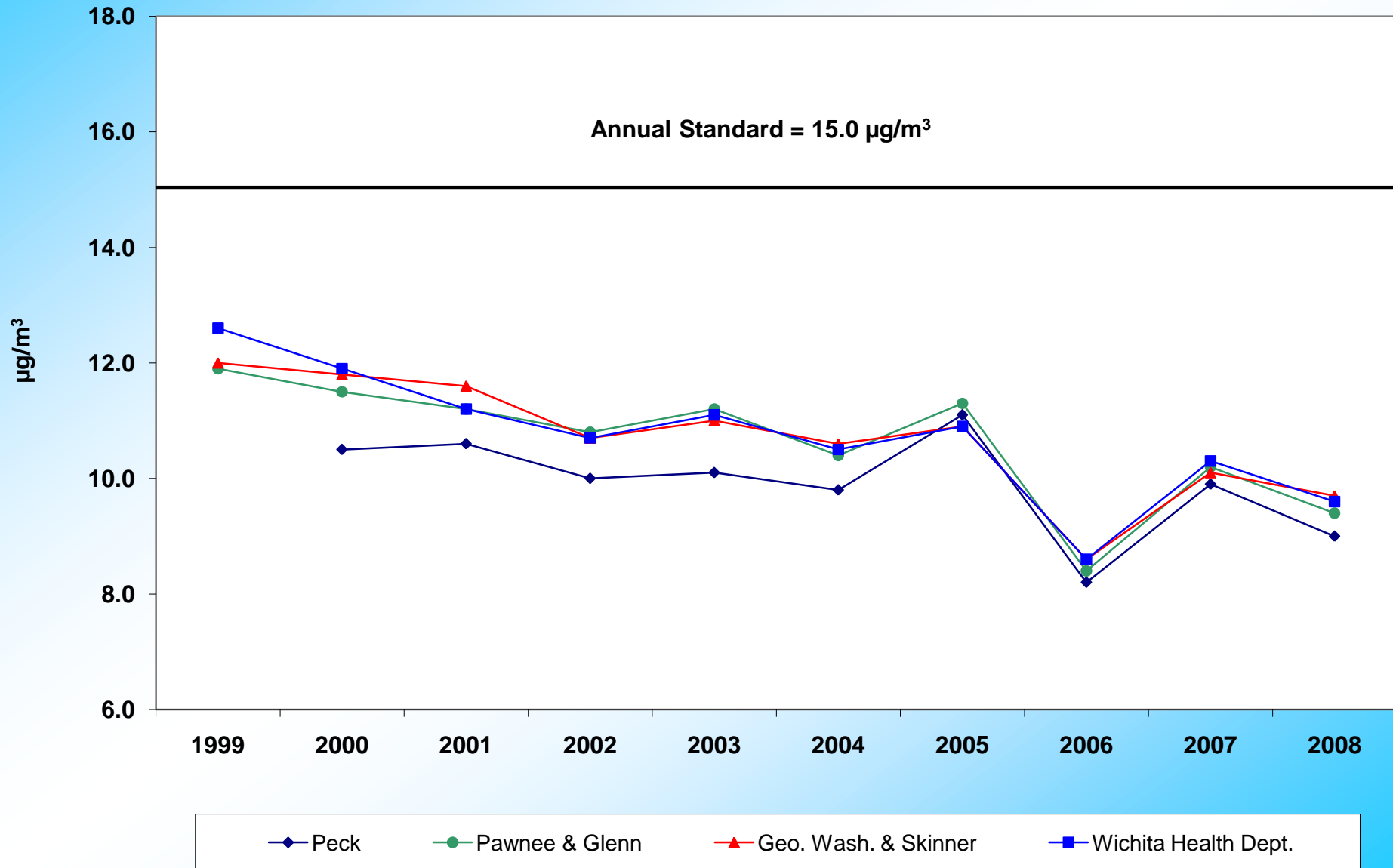
- There was a slight downturn in ozone concentrations in 2007 & 2008.
- Federal standards have required cleaner fuels (gas & diesel) and more efficient on and off road vehicle engines.
- New federal standards (MACTS) are being implemented to control emissions from smaller businesses (drycleaners, plating facilities, machine shops, print shops, etc).
- New federal standards for small engines (mowers, chain saws, etc.) are also coming.

Air Pollutants of Local Concern

- Ground Level Ozone (O_3)
- Particulate Matter
 - PM 2.5
 - PM 10
- Air Toxics

Wichita Particulate Trends

PM_{2.5} Annual Means



Air Pollutants of Local Concern

- Ground Level Ozone (O_3)
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- Air Toxics

Air Toxics Sampling Project

- Sampling for approximately 60 volatile organic compounds (VOC's) listed by EPA as urban hazardous air pollutants
- Program uses EPA Method TO-15 for sampling and analysis protocols
- Data can be used for trend analysis – data spans from 1989 to 2006



Air Toxics Sampling Project

- In 2007, a KUMC student conducted a Capstone (Masters Thesis) using our air toxics data. Results included:
- Trend analysis (year to year)
- Most abundant compounds in Wichita air
- Most toxic compounds in Wichita air
- Recommendations for further air toxics sampling projects.

Air Toxics Compounds in Wichita Air that Exceed Health Thresholds

- Benzene
- Carbon tetrachloride
- Methylene chloride
- Trichloroethene
- Toluene
- Xylene
- 1,4-dioxane
- Bromomethane

Air Pollutants of Local Concern

- Ground Level Ozone (O_3)
- Particulate Matter
 - PM 2.5
 - PM 10
- Air Toxics
- Greenhouse Gases?

The Greenhouse Effect



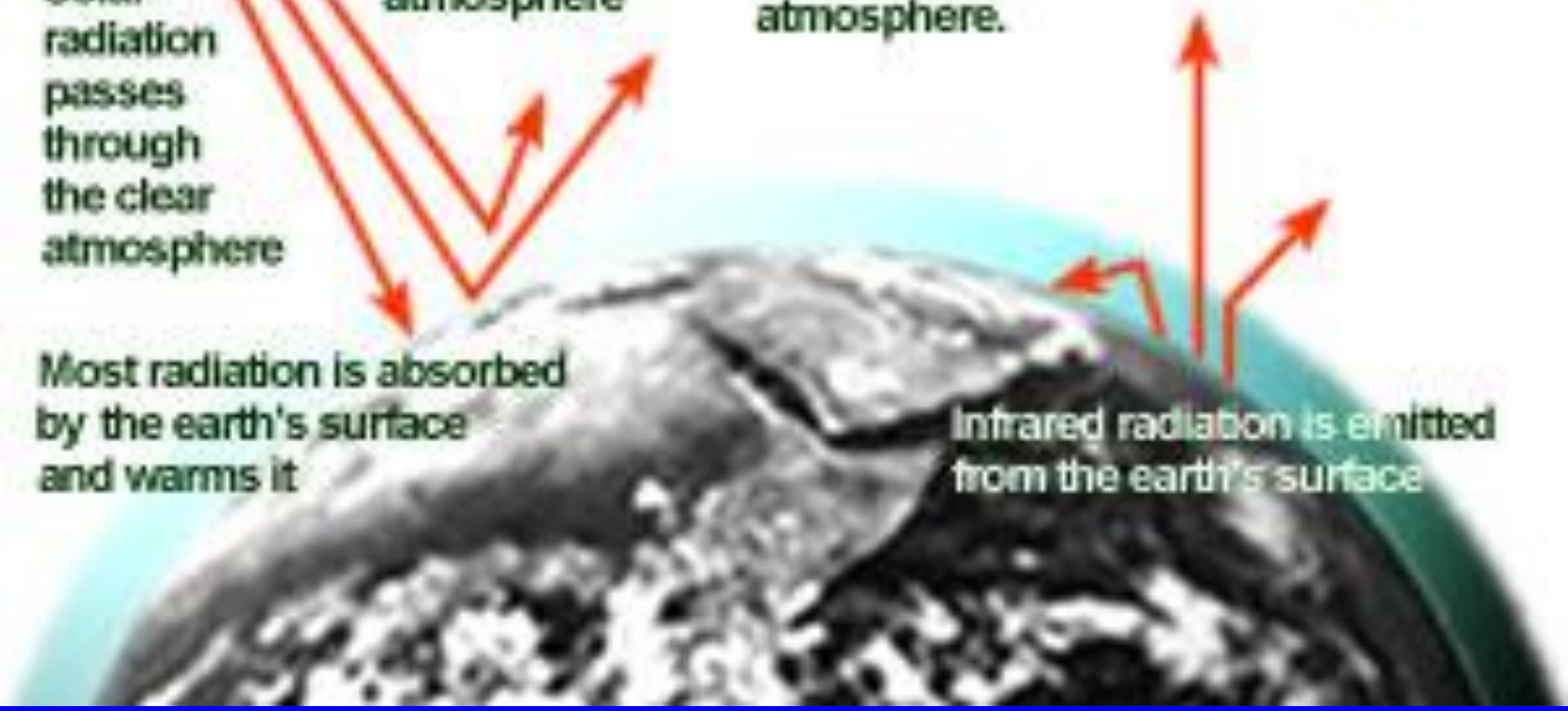
Some solar radiation is reflected by the earth and the atmosphere

Solar radiation passes through the clear atmosphere

Most radiation is absorbed by the earth's surface and warms it

Some of the infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the earth's surface and the lower atmosphere.

Infrared radiation is emitted from the earth's surface



A Wichita Solution

- City staff and the Air Quality Improvement Task Force both recommended to City Council that the City should develop a local Plan to reduce both ozone and greenhouse gases (GHG's).
- The good news is that conservation efforts that help reduce GHG emissions will also help reduce ozone and vice versa.

Major City Energy Efficiency Improvements – Past 10 years

- **\$10 million bus and van change out**
- **Fuel changes for buses**
- **City building energy reduction initiatives**
- **Stop light change outs**
- **Street light change outs**
- **Intelligent transportation system**
- **Landfill methane recovered and sold to private company for fuel**

City Energy Efficiency Improvements – Next 10 years

- Intelligent Transportation Systems
 - Railroad crossing upgrades
 - Traffic light synchronization
- Traffic light change out to LED's
- Street light change out to LED's
- Improved energy efficiency of City buildings
- Purchase more efficient City vehicles
 - Hybrids, electric vehicles, etc

What Can Citizens Do To Help Improve Air Quality?

- Report any open burning in the city or county
- Report excess smoke from industry
- Report fuel spills
- Keep all paints, solvents, chemicals & cleaners, whether at home or work, sealed when not in use

Keep Our Air Plain

- Fuel when it's cool (after 6pm)
- Don't top off gas tanks (stop at the click)
- Don't idle vehicles unnecessarily
- Carpool, ride the bus, walk, bicycle
- Conserve electricity
- Put off lawn work until after 6pm
- Purchase *energy star* labeled products

Keep your car well maintained

- Maintaining your car will-
- help you protect your investment,
- improve vehicle performance,
- improve your gas mileage
- -- and also help fight smog.

Drive Responsibly

- Go Easy on the Brakes & Gas Pedal
- Avoid Long Idles
- Avoid Carrying Unneeded Items in the Trunk of the Car
- Avoid High Speeds
- Use the Air Conditioner Only When Necessary
- Use Overdrive for Highway Driving
- Keep Tires Properly Inflated & Aligned
- Get Regular Engine Tune-ups & Car Maintenance Checks

**The Health, Environmental,
& Economic Effects of Air
Pollution Reduce
the Quality of Life
for All Of Us**

John Stark, R.S.
Air Quality-HazMat Program Supervisor
Wichita Department of Environmental Services

- For questions or further information email or call -
 - JStark@wichita.gov
 - 316-268-8353
- Our air quality web site
 - www.wichita.gov/CityOffices/Environmental/AirQuality
- For real-time local air quality data-
 - www.wichita.gov/aq